APPLICATION OF DIGITAL TOOLS FOR TEACHING HEALTH EDUCATION: CHALLENGES AND SUGGESSTIONS FOR OPTIMAL UTILISATION

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Abstract
Digital tools are meant to transform health education by enhancing accessibility to health resources, engagement, and improving learning outcomes. E-learning platforms, mobile apps, and social media are increasingly used to deliver health education in schools and communities. These tools support flexible learning, offer personalized content, and help students manage health behaviours, particularly in areas like nutrition, mental health, and physical activity. Digital tools also bridge gaps for underserved populations by providing remote access to critical health information and resources. However, challenges such as inadequate technology access, privacy concerns, and the need for specialized training hinder their widespread adoption. Solutions include phased implementation, ongoing training, and cross-functional collaboration. Despite these barriers, the integration of digital tools offers a promising future for health education, fostering better public health outcomes and preparing students for modern healthcare challenges. Effective use of these tools requires ongoing investment, training, and a supportive infrastructure to ensure their resourceful utilisation.

Introduction
Digital tools encompass a wide range of technologies that support learning, enhance productivity, and improve access to information across various fields, including health education. Schools are increasingly adopting e-learning platforms such as Moodle, Google Classroom, and Blackboard to facilitate health education. These platforms allow teachers to distribute resources such as videos, info-graphics, articles, and quizzes, enabling students to engage with the content both during class time and outside the classroom. According to Shen and Hsieh (2021), online courses in health education have been shown to improve knowledge retention and provide a flexible learning environment, allowing students to learn at their own pace. Mobile applications designed for health education can be a valuable resource for students to manage and monitor their health behaviours.

Apps like Headspace (for mental health), MyFitnessPal (for physical activity and nutrition) and Smoke Free (for smoking cessation) offer practical tools that help students make informed decisions about their health. Van Royen et al. (2020) indicated that students who used health education apps experienced improvements in lifestyle behaviors, particularly in the areas of exercise and nutrition. Social media platforms such as Instagram, TikTok, and YouTube are powerful tools for health education, as they allow for creative and

interactive dissemination of health education messages. These platforms can be used to create awareness campaigns, share expert advice and provide peer-led health education information.

Peer education through social media has become a significant means of promoting health behaviors, especially in youth, as it leverages peer influence and familiarity with these digital spaces (Fox & Jones, 2020). Also, González et al. (2021) affirmed that online health webinars have become particularly important in rural and underserved communities, where in-person health education programs are often limited. In the wider community, digital tools offer unique opportunities to reach a broader audience, including those who may not have access to traditional face-to-face health education resources. Community-based health education can focus on a wide range of health issues, from chronic disease prevention to mental health promotion. Digital tools allow health messages to reach individuals across geographical locations, overcoming barriers such as transportation and socioeconomic status.

Similarly, simulation technologies, including virtual reality (VR) and augmented reality (AR), provide immense learning experiences that enhance practical skills in health education. Simulation-based education leads to significant improvements in clinical competencies and learner confidence. Health education is a vital component of public health initiatives, aiming to improve health literacy and promote healthy behaviors among individuals. Health education plays a crucial role in promoting healthy behaviors and improving public health outcomes. With the rapid advancement of technology, digital tools have increasingly become a powerful means to deliver health education, both in schools and in the wider community. The integration of digital tools offers numerous advantages in terms of accessibility, engagement, and efficiency in promoting health education and encouraging health-promoting behaviors (Kneebone & Nestel, 2020).

In addition, health and digital literacy play a vital role in promoting better health outcomes for individuals and communities (Shao et al., 2023). The integration of digital tools into health education has transformed conventional methods of teaching, making learning more accessible, engaging, and personalized. The landscape of health education is rapidly evolving, driven by technological advancements and the increasing demand for accessible, high-quality educational resources. Digital tools are now integral to teaching health education, offering innovative ways to enhance learning experiences. E-learning platforms, such as Moodle, Blackboard, **Google Classroom**, Health Education mobile applications and Canvas have been used to provide structured environments for delivering health education courses. These platforms enhance the learning process and allow students to engage with course materials at their own pace. McCarthy and O'Neill (2021) demonstrate that students using e-learning platforms in health education reported higher satisfaction and better learning outcomes compared to traditional classroom settings.

The Role of Digital Tools in Enhancing Teaching of Health Education

The use of digital tools allows students to access pre-recorded lectures, read articles, and takes quizzes or participate in discussion forums at their own pace. For example, the Global Health Learning Center by the U.S. Centers for Disease Control and Prevention (CDC)

offers a range of online courses for public health professionals to learn about key health topics like infectious diseases and health systems strengthening (CDC, 2023). Digital tools allow students to engage with real datasets, such as global disease surveillance data, health surveys, and demographic data. For example, Johns Hopkins University's Bloomberg School of Public Health incorporates data analytics into its public health curriculum, where students learn to use software tools to analyze public health issues like health disparities, infectious disease dynamics, and health systems performance (JHU, 2022).

Public health professionals often work in interdisciplinary teams, requiring strong collaborative skills. Digital communication platforms such as Zoom, Microsoft Teams and Slack are used to facilitate collaborative learning in remote or hybrid environments. These tools enable virtual group discussions, team projects, and brainstorming sessions, where students can work together to analyze public health problems, discuss case studies, and create intervention strategies. Also, digital tools platforms also support networking opportunities between students, faculty, and public health practitioners, allowing for mentorship and professional development. For instance, the Public Health Agency of Canada (PHAC) offers virtual seminars and webinars on emerging public health issues, providing students with the chance to engage with experts in the field (PHAC, 2023).

Additionally, digital tools have expanded the concept of "fieldwork" in public health, allowing students to participate in virtual global health experiences. Virtual exchanges and international learning programs allow students to work with peers from different countries on health projects, sharing perspectives and learning about global health challenges in real-time. Programs like Global Health eLearning by Global Health Learning Network (GHLN) offer virtual field experiences that expose students to public health issues in low-resource settings, providing valuable global perspectives on health systems, environmental health, and infectious disease control (GHLN, 2023).

Importance of Digital Tools in Health Education

Digital tools in education offer an interactive and dynamic way to present information that is often more engaging than traditional methods. These tools are particularly valuable in delivering content related to nutrition, physical activity, mental health, substance abuse prevention, and sexual health. Digital tools can significantly increase student engagement through interactive content and gamification. Hamari et al. (2020) established that gamified learning environments not only increase motivation but also foster deeper learning experiences, which are essential for effective health education. Digital tools, such as mobile health apps, telemedicine and online health information resources have expanded substantial acceptance and are progressively being integrated into education systems.

In addition, mobile health apps provide convenient access to health information, self-monitoring tools and personalised interventions, empowering individuals to actively monitor their healthcare system. Furthermore, online health information resources offer a wealth of information that can support health education (Laranjo et al., 2018; Weitz et al., 2022).Also, digital tools improved and expand access to health education resources, especially for underserved populations. Online courses and mobile apps can reach individuals in remote areas, providing them with critical health information. Similarly, Zewdie

and Pritchard (2021) emphasizes the role of digital tools in improving health education access among marginalized communities. Lastly, digital tools facilitate personalized learning experiences by allowing students to progress at their own pace and receive tailored feedback. Digital tools and adaptive learning technologies can improve mental health and wellbeing, individual learning needs and enhancing overall educational outcomes in health education (Berardi et al., 2024).

Challenges in Implementing Digital Tools in Health Education Teaching

Despite the advantages of digital tools in many climes, the integration of digital tools in health education faces challenges such as inadequate access to technology and internet connectivity due to lack of financial resources. Many communities in Nigeria still lack internet facilities which hinder access to technology for improved learning. According to Berardi et al. (2024), low-income and rural populations witness barriers in accessing current digital tools limiting their ability to benefit from digital health education resources. The integration of digital tools in professional settings offers significant benefits, including increased efficiency, accessibility, and scalability of services. However, practitioners across various fields, from healthcare to education to business, often encounter challenges when integrating these tools into their daily workflows, such as lack of sufficient training and technological proficiency in the tools that professionals are expected to use. Also many digital tools require specialized knowledge and skills that may not be part of a practitioner's initial education or training.

The above gap can lead to inefficient use of the technology or even resistance to its adoption. Buntin et al. (2011) found out that healthcare professionals, particularly in smaller practices, struggled with the complexity of electronic health records (EHRs) because they lacked the necessary training. This inefficiency can lead to frustrations and errors that compromise both productivity and patient care. Digital tools can be complex, particularly for organizations or individuals who are not technologically advanced. This complexity is evident in software that may require substantial technical knowledge to operate effectively, or in systems that need to be integrated with existing technologies.

According to Ahmed et al. (2020), healthcare practitioners often struggle to integrate electronic health record (EHR) systems with older systems, leading to inefficiencies or errors. The adoption of digital tools often involves the collection, storage, and sharing of large volumes of data, increasing concerns about data security and privacy. For practitioners, especially in sectors such as healthcare, law, and finance, safeguarding client or patient information is a top priority. A lack of robust cyber security protocols can result in data breaches, compromising sensitive information and damaging the trust of stakeholders. For instance, a study by Binns et al. (2019) highlighted that healthcare practitioners are frequently concerned about the risks of cyber-attacks targeting digital tools used in patient care, such as telemedicine platforms and EHRs. These security issues can discourage the adoption of new technologies, even when they promise efficiency and convenience.

Also, successful implementation of digital tools often depends on adequate training and ongoing technical support. Without sufficient training, practitioners may not be able to

use digital tools to their full potential, leading to underutilisation or misuse of the technology. In a study on digital transformation in education, Erlangga et al. (2024) observed that many teachers and administrators struggled with the transition to digital platforms due to insufficient professional development opportunities. Similarly, in healthcare, insufficient training in the use of EHR systems has been shown to lead to frequent errors and inefficiencies (Fitzgerald et al., 2020). In addition, the financial investment required to implement digital tools can be a significant barrier, especially for smaller organizations or those in resource-constrained settings. Costs may include the price of software, hardware, training, and ongoing maintenance, all of which can be prohibitive for some practitioners or institutions.

According to Tan and Liu (2020), small and medium-sized enterprises (SMEs) often struggle to adopt advanced digital technologies due to budgetary limitations, despite the potential for long-term cost savings and productivity gains. The initial cost of digital tools, combined with the challenge of securing sufficient funding for training and support, can deter practitioners from making the transition. The successful implementation of digital tools requires comprehensive training for tutors. Many instructors may be resistant in adopting new technologies due to a lack of familiarity or confidence. Ertmer and Ottenbreit-Leftwich (2010) emphasizes that educators should be equipped with the necessary skills to effectively integrate digital tools into their teaching practices. Similarly, the digital technology has the greatest potential to promote health and prevent disease for individuals and communities throughout the world. Addressing inaccurate and misleading information, lack of investment, the wide gap, and security and privacy issues in digital technology (Ren et al., 2015).

Possible Solutions to the Challenges Facing the Use of Digital Tools in The Teaching Of Health Education

Introducing digital tools in phases, along with adequate incentives and rewards for early adopters, can help ease the transition. Studies in healthcare have shown that small, incremental changes, such as starting with less complex tools and gradually increasing their sophistication, can help practitioners adapt without feeling overwhelmed (Haines et al., 2020). Also, offering incentives for successful adoption or providing recognition for employees who champion digital initiatives can improve engagement. Organizations should prioritize creating a culture that values digital innovation. This can be achieved by offering leadership training, aligning digital strategies with educational goals, and establishing clear communication about the role of technology in achieving success (Bharadwaj et al., 2020).

Similarly, training programs should not be one-time events but rather part of an ongoing learning cycle. These programs should be tailored to different levels of expertise and learning styles. For example, hands-on workshops, video tutorials, and peer mentoring can all be incorporated into training plans and encouraging collaboration between IT teams, leadership, and end-users is vital for overcoming cultural barriers. The integration of digital tools should not be seen as the responsibility of one department but as a shared endeavor. Cross-functional teams that include representatives from various departments can help

ensure that digital tools are implemented in a way that supports diverse needs and perspectives (Gao et al., 2021).

Conclusion

Digital tools present a significant opportunity to enhance education and health promotion by improving accessibility, engagement, and personalization. While challenges such as technological complexity and resistance to change exist, these can be addressed through adequate training, strategic leadership, and robust support systems. With continued investment and focus on overcoming barriers, digital tools can effectively transform education and healthcare practices, preparing learners and professionals to meet the evolving demands of global health development.

Based on the aforementioned, the following recommendations were made:

1. Frequent Digital Skill Development: Regular conferences and seminars should be held for students and educators to learn and gain proficiency in digital tools and skills.
2. Investment in Digital Education: Adequate funding should be allocated to support digital education for both students and educators.
3. Provision of Necessary Technology: Ensure access to the necessary technology, digital tools, and reliable Internet to facilitate effective teaching and learning.
5. Address Technological Barriers: Overcome challenges related to technology by providing appropriate training for educators and addressing issues like data security and technological complexity.
6. Utilize Digital Tools for Health Education: Continue integrating digital tools (e.g., e-learning platforms, mobile apps, virtual consultations) in health education and promotion at both school and community levels.
7. Support for Digital Transformation: Implement strategic leadership, training, and ongoing support to help overcome challenges like resistance to change and financial constraints in adopting digital tools.

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